BOARD OF OIL, GAS AND MINING
2012 EARTH DAY AWARD NOMINATION

REVIEW SHEET

NOMINATION: Questar Pipeline Co.

ACTIVITY: Oil & Gas

CATEGORY: Outstanding final reclamation or restoration

STAFF RECOMMENDATION:

☑ Invite nominee to make presentation in March

☐ Do not invite

REASON:

REVIEWED BY:

2012
UTAH BOARD OF OIL, GAS AND MINING
EARTH DAY AWARDS

Nomination Form

Nominee Information

Company Name	**Questar Pipeline Company**
Address	**1140 W. 200 S., P.O. Box 45360**
City, State, Zip	**Salt Lake City, UT 84145**
Contact Person	**Mark Stewart**
Phone	**(801) 324-3972**
Site Name	**Mainline 104 Extension to Fidlar Project – Lower Green River Corridor**
Location	**Uintah County**

Activity and Category (Please check one activity and one category)

Activity

X **Oil and Gas**

Category

X **Outstanding final reclamation or site restoration**

Nominated By **Questar Pipeline Company**

Name
Address
City,State, Zip.
Phone_____

Nomination Summary (attach additional sheets, photos, etc.., as necessary)
See attached document with description and photos of the reclamation and visual resource efforts.

Return no later than January 31, 2012 to: Earth Day Awards, Division of Oil, Gas and Mining, 1594 West North Temple, Suite 1210, P.O. Box 145801.Salt Lake City, Utah 84114-5801. Phone (801) 538-5324 Fax (801) 359-3940. Nominations may also be submitted electronically, email to jimspringer@utah.gov

Questar Pipeline Company's
Mainline 104 Extension to Fidlar Project
Uintah County, Utah

In 2011, Questar Pipeline Company (Questar) installed a 24-inch-diameter high pressure natural gas transmission pipeline in Uintah County. The 24.6-mile pipeline project, entitled Mainline 104 Extension to Fidlar (ML 104 or Project), extended from Questar's existing Green River block valve (T10S, R18E, Section 13) easterly to Questar's Fidlar Compressor Station (T9S, R22E, Section 19). ML 104 was routed to closely parallel existing pipeline rights-of-way and stay within a designated energy corridor along most of the route.

Visual Resource Mitigation along the Lower Green River Corridor

A very sensitive section of the Project was where the right-of-way crossed the Green River. Though this one mile portion of the pipeline alignment is within the energy corridor, the Bureau of Land Management (BLM) is managing activities to protect the scenic characteristics of this area which has been designated as an Area of Critical Environmental Concern and as an area suitable for listing as a Wild and Scenic River. BLM's objectives focus on retaining the existing character of the landscape and not attracting the attention of the casual observer.

To greatly minimize visual impacts and to meet or exceed BLM visual resource requirements, Questar implemented a number of innovative mitigation measures throughout the construction process.

<u>Prior to Construction:</u>

- Questar met onsite with BLM resource specialists, including a visual resource management specialist with the state office, to seek input and assistance.
- Questar developed a visual assessment based on 11 Key Observation Points (KOPs) that represented likely positions of casual observers in the project area. See attached figure entitled Overview of Observation Points.
- Questar completed a viewshed analysis from each KOP using ArcGIS's Spatial Analyst extension. Through use of this tool, Questar was able to graphically represent a potential viewer's perspective from each of the KOPs based on the potential viewer's elevation and his or her relationship to the landforms and elevations within the viewshed. For the Green River KOPs, Questar modeled a viewer's perspective without any riparian buffer as a conservative representation of viewshed, and also modeled a more realistic scenario assuming a riparian buffer along the waterway. See attached figures entitled Viewshed Analysis - Green River 3 and Green River 4.
- Questar analyzed each of the KOPs to determine potential impacts.
- Questar floated the Green River to provide video documentation of the visual environment prior to construction. The river float video verified the viewshed analysis showing that the pipeline alignment on the west side of the Green River would not be visible from the crossing location due to dense riparian vegetation on the west bank and the location of the route was within a low spot on the landscape. The route on the east side of the Green River was also obscured in many locations by vegetation and topography.
- A route was chosen to avoid areas where full restoration, due to large rock faces and sheer cliffs, would not be possible.

Construction, Reclamation, and Mitigation Measures:

- Questar maintained existing riparian vegetation along the river to provide a visual barrier between a casual observer from the river and construction activities.
- Questar routed the pipeline down the west side of the Green River valley in an existing draw and along a two-tracked/bladed road to reduce the potential visibility of the crossing. The road was reclaimed at the end of construction with agency approval to further improve the existing visible condition.
- Questar crossed the Green River using a Horizontal Directional Drill method and set up equipment on mats to minimize rutting and other disturbances to the river banks.
- Questar utilized a recently disturbed staging area to construct up the main face of the steepest slope on the east side of the Green River, reducing additional disturbance.
- Disturbed areas were reseeded utilizing native species, and in some rocky, non-fertile locations reclamation was supplemented with mycorrhizal inoculum and slow release fertilizer to stimulate growth.
- Where boulders and rock ledges were re-established along the east hillside, a rock stain (Permeon™) will be applied in 2012 to further match the weathered look of surrounding, non-disturbed rock ledges.

Summary:

Questar feels that substantial effort, attention to detail, and new and innovative approaches associated with the Green River crossing location produced exceptional visual results. Since "pictures are worth a thousand words", included in this submittal are several pictures taken before construction, during construction, and immediately after reclamation, highlighting the process and results. As the Project was completed and reseeded in the fall of 2011, vegetation growth has not yet been established. However, even without new vegetation, disturbed areas in the critical Lower Green River corridor are virtually unnoticeable. Growth of vegetation, along with the addition of the rock stain, will further reduce any visual impacts.

Mr. Rob Sweeten, the visual resource management lead for the Utah State BLM Office, wrote the following on completion of the Project.

> *I have been very impressed with Questar and as I stated the work on the ML104 Extension to Fidlar pipeline was some of the best work I have seen in my 19 years of working on visual issues. From beginning to end this project was conducted in a professional manner. The site visits were productive and the mitigation was targeted. Someone who was floating the river would never know that a major pipeline crossed their path. The attention to detail and the commitment of Questar to work with the BLM was critical to the success of this project. Upon completion everyone wins because Questar was able to build their pipeline and the people who visit the area and float the river will never know that there is a major gas line in the area.*

It should be noted that Mr. Sweeten and the other trainers working for the BLM are including ML 104 as an example project as part of their 2012 visual resource management training program. The program, which is being given to the major linear utility companies in Utah and potentially nationwide, includes a discussion on the procedures employed during the Project and includes photos of the Green River site throughout the construction and reclamation process. A copy of the training presentation is attached along with a copy of Mr. Sweeten's full email message, a portion of which was mentioned above. The sections of the program having to do with ML 104 are on pages 16 and 17.

VIEWSHED ANALYSIS

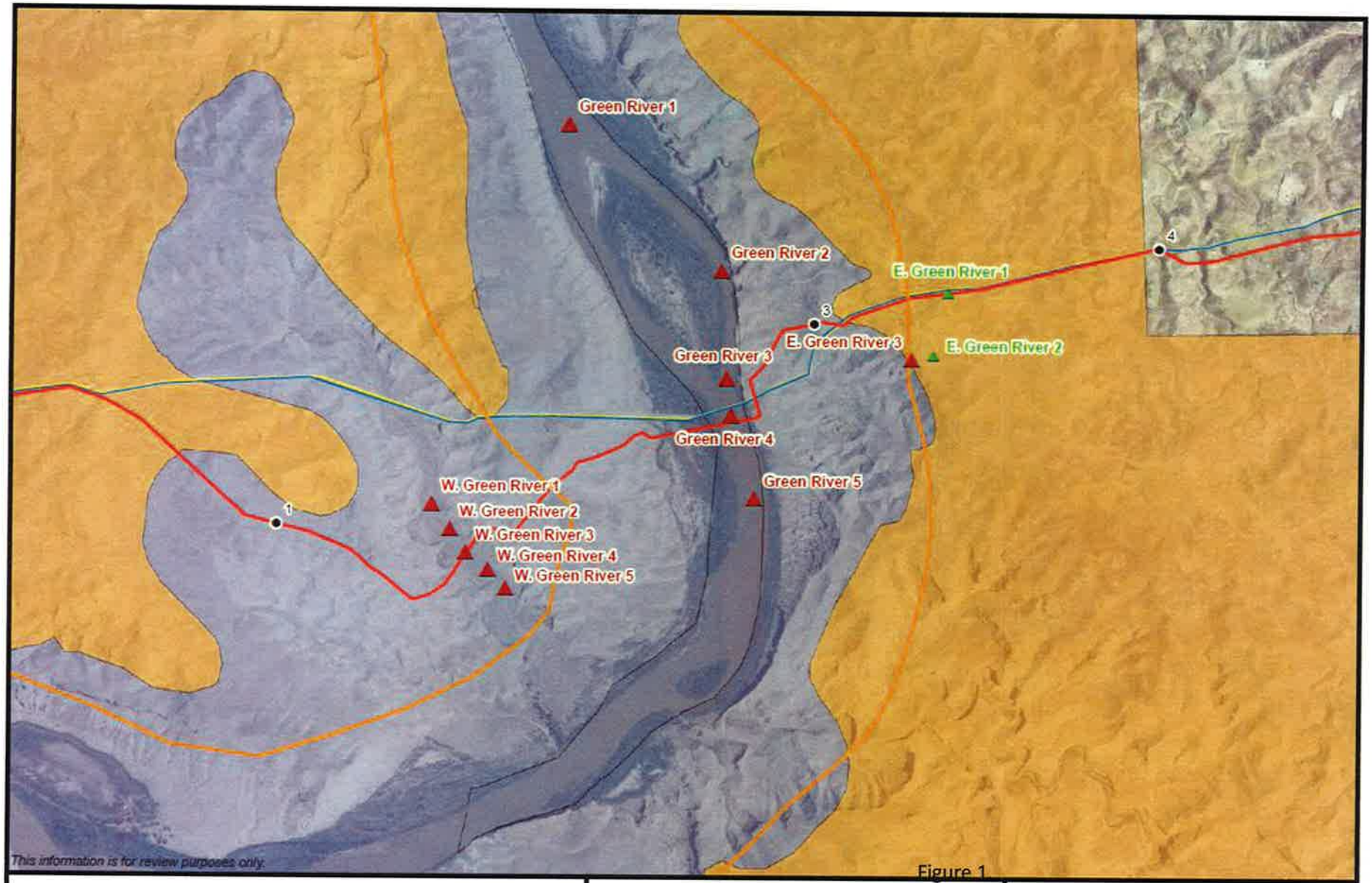

Figure 1

Proposed ML 104 Extension
Milepost
Existing ML40
Existing Three Rivers Pipeline
Half Mile Buffer
Key Observation Point
Observation Point
VRM Class II
VRM Class III
VRM Class IV

1:24,000 1 inch = 2,000 feet

0 2,000 4,000 Feet

N

Aerial photography: 2009 National Agricultural Imagery Program (NAIP), 1-meter resolution.

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QUESTAR

ML104 Extension to Fidlar Project

Overview of Observation Points


Observation Point
Milepost
Proposed ML 104 Extension
Existing ML40
Existing Three Rivers Pipeline
Visible Viewshed
1:24,000 1 inch = 2,000 feet
0 2,000 4,000 Feet
QUESTAR
ML104 Extension to Fidlar Project
Viewshed Analysis
Green River 3 - No Canopy


Observation Point
Milepost
Proposed ML 104 Extension
Existing ML40
Existing Three Rivers Pipeline
Visible Viewshed
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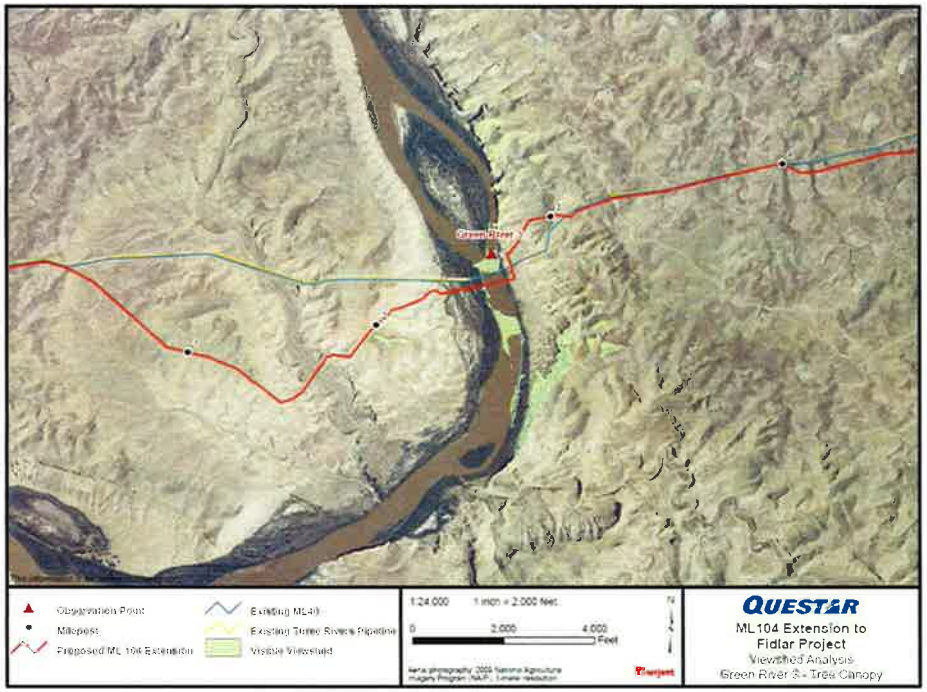
QUESTAR
ML104 Extension to Fidlar Project
Viewshed Analysis
Green River 4 - No Canopy


Observation Point
Milepost
Proposed ML 104 Extension
Existing ML40
Existing Three Rivers Pipeline
Visible Viewshed
1:24,000 1 inch = 2,000 feet
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QUESTAR
ML104 Extension to Fidlar Project
Viewshed Analysis
Green River 3 - Tree Canopy


Observation Point
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0 2,000 4,000 Feet
QUESTAR
ML104 Extension to Fidlar Project
Viewshed Analysis
Green River 4 - Tree Canopy

PROJECT PHOTOS OF THE GREEN RIVER CROSSING AREA

East Side of Green River

East Side of Green River (photo taken in 2010 prior to construction)

East Side of Green River (photo taken in 2010 prior to construction)

East Side of Green River

East Side of Green River (photo taken in summer 2011 during construction)

East Side of Green River (photo taken in summer 2011 during construction)

East Side of Green River

East Side of Green River (photo taken in early fall 2011 during construction)

East Side of Green River (photo taken in early fall 2011 during construction)

East Side of Green River

East Side of Green River (photo taken in fall 2011 after construction was completed)

East Side of Green River (photo taken in fall 2011 after construction was completed)

West Side of Green River

West Side of Green River (photo taken in early fall 2011 during construction)

West Side of Green River (photo taken in fall 2011 after construction was completed)

BLM Comments on Mitigation Efforts

From: Sweeten, Robert L [mailto:rsweeten@blm.gov]
Sent: Monday, January 23, 2012 12:01 PM
To: Mark Stewart; Stiewig, Michael G
Cc: West, Jason R; Garcia-Knox, Suzanne
Subject: RE: Earth Day Award Application - DOGM

Mark,

Thank you for hosting the VRM training and for having so many employees attend. I have been very impressed with Questar and as I stated the work on the ML104 Extension to Fidlar pipeline was some of the best work I have seen in my 19 years of working on visual issues. From beginning to end this project was conducted in a professional manner. The site visits were productive and the mitigation was targeted. Someone who was floating the river would never know that a major pipeline crossed their path. The attention to detail and the commitment of Questar to work with the BLM was critical to the success of this project. Upon completion everyone wins because Questar was able to build their pipeline and the people who visit the area and float the river will never know that there is a major gas line in the area. This project also represents a team effort that is commendable. Everyone involved with the project including Questar management and construction crews and the BLM staff worked together to make this project a success.

Thanks again and I look forward to working with you on future projects as requested from the Field Office. Please feel free to contact me with any questions or comments you may have.

Rob Sweeten
BLM Utah State Office Landscape Architect/VRM Lead
440 West 200 South Suite 500
SLC, UT 84101-1345
Office: 801-539-4075
Cell: 801-558-7645
Fax: 801-539-4074
rob_sweeten@blm.gov

BLM Visual Resource Training Guide for Linear Elements

Visual Resource Management

"By law, BLM is responsible for managing these public lands for multiple uses. But BLM is also responsible for ensuring that the scenic values of these public lands are considered before allowing uses that may have negative visual impacts."- BLM Visual Resource Management

What is Visual Resource Management (VRM)?

- Visual resource management (VRM) is a system for minimizing the visual impacts of surface-disturbing activities and maintaining scenic values for the future.

VRM Definition

- The inventory and planning actions taken to identify visual values and to establish objectives for managing those values; and the management actions taken to achieve the visual management objectives.

Importance of VRM

- The BLM manages a diversity of landscapes, over 260 million acres, each with a unique sense of place.
- BLM lands have multiple uses that create the potential for visual impacts. There is a growing demand for land use such as communication sites, rights-of-way, recreation use, energy and mineral development.

Importance of VRM (cont'd)

- If not carefully planned and designed, those activities have potential to greatly modify the character of the landscape.
- Poorly designed activities may result in undesirable consequences to local communities' economy, quality of life, and visitor experiences.

Population Growth and Tourism

- Western states have experienced rapid growth and development.
  Public lands have been increasingly used for outdoor recreation and tourism.
- Many rural communities are reliant on tourism to sustain their economies.
- Thus, the management of the scenic values of public lands has become a much more important aspect of natural resource management to BLM.

Visual Resource Management (VRM) is BLM's system to:

- Help identify scenic values
- Minimize visual impacts to landscape character of public lands
- Quantifies landscape value
- The VRM system helps lend objectivity to the process

Benefits of Addressing Visual Concerns

- The benefits to be gained by carefully designing surface-disturbing activities to minimize visual impacts are readily apparent.
- The BLM is committed to sound management of the scenic values on public lands in order to ensure that these benefits are realized and the scenic values are protected.

Legal Obligation and Authorities

- By law, the BLM is responsible for managing public lands for multiple uses. They are also responsible for ensuring that the scenic values of these public lands are considered before allowing uses that may have negative visual impacts.

Federal Guidelines

- The National Environmental Policy Act of 1969 (NEPA) Sections 101b, 102
- The Federal Land policy and Management Act of 1976 (FLPMA) Sections 102a, 103c, 210a, 505a
- BLM Policy: Manual Section 8400 – Visual Resource Management

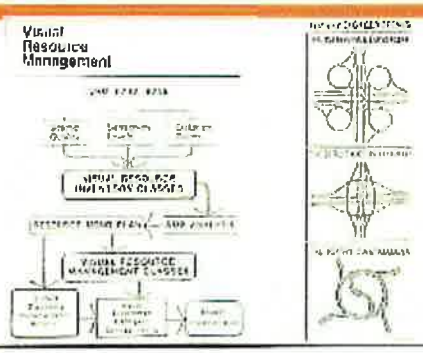
VRM System Overview

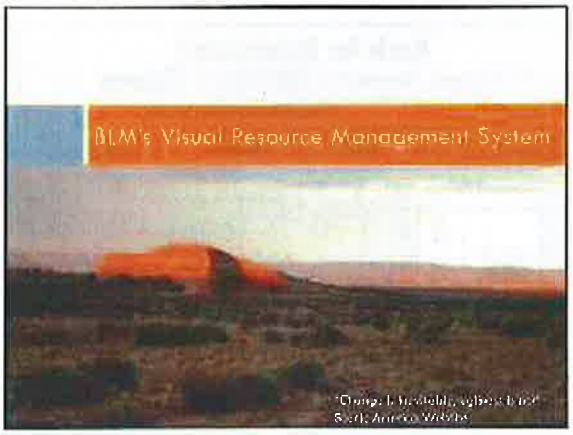
- Public lands have a variety of visual values which warrant different levels of management. VRM is used to systematically identify and evaluate these values to determine the appropriate management objectives and to design activities to meet those objectives.

The VRM Process Involves:

- Inventory of scenic values
- Establishing management objectives for those values through the resource management planning process
- Evaluating proposed activities to analyze effects and develop mitigations to meet established VRM objectives

VRM flow chart graphic





Inventory

- A resource inventory is a systematic process designed to determine what resources are on public lands.
- Visual values are identified through the VRM inventory process (Manual section 8410)
- Visual resource inventory is based on an analysis of three primary criteria influencing visual values; a) Scenic Quality b) Public Sensitivity c) Distance Zones from primary travel ways or special areas.
- A matrix is used to combine relative ratings in each of the criteria to come up with an overall Visual Resource Inventory rating.

KOP

KOP- Key Observation Point

- Scenic Overlooks, Rivers & Roads
- Important Vantage Points
- Places from which a proposed project is seen by large numbers of viewers (representative) or critical viewers
- Views From Communities or Subdivisions
- Point where view of proposed project is most revealing (careful to avoid bias in analysis)

KOP Example

KOP Map

Inventories have 3 parts

- Scenic Quality Evaluation (Categorize as A, B, or C)
- Sensitivity Level Analysis (High, Med, Low)
- Delineation of Distance Zones (Fore, middle, and background.)

Inventories have 4 Classes

- Class I- Natural
- Class II
- Class III
- Class IV

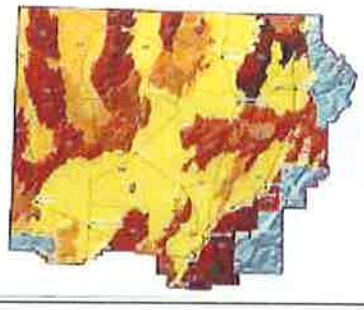
Classes I, II, and IV are a combination of scenic quality, sensitivity levels, and distance zones

Basis for Determining Visual Resource Inventory Classes

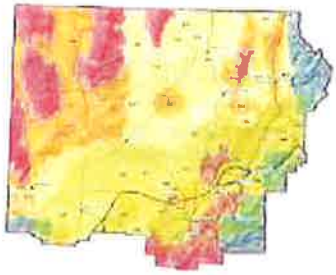
		Visual Sensitivity Levels						
		High			Medium			Low
Special Areas		I	I	I	I	I	I	I
Scenic Quality	A	II	II	II	II	II	II	II
	B	II	III	III/IV*	III	IV	IV	IV
	C	III	IV	IV	IV	IV	IV	IV
		f/m	b	s/s	f/m	b	s/s	s/s
		Distance Zones						

* If adjacent area is Class III or lower, (ie - Class I (assign Class II), if Major, (ie. Class IV) Class II

Scenic Quality Rating



Sensitivity Analysis



Distance Zones

Inventory Classes

Questions

1. What is VRM?
2. What is included in an inventory?
3. What is a Sensitivity Analysis?
4. Who benefits from the VRM system?

Break…

Management Classes

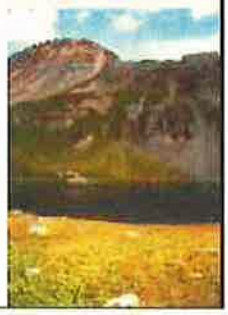
- VRM Classes are area-specific objectives that provide the standards for planning, designing, and evaluating future management projects
- Landscapes are designated from Class I to Class IV based on management decisions made in the Resource Management Plan (RMP)
- Class I is assigned to all special areas where the current management situations requires maintaining a natural environment essentially unaltered by man.
- Classes II, III, IV are assigned based on combinations of scenic quality, sensitivity levels, and distance zones.

VRM Management Classes

Class I -Class II -Class III-Class IV

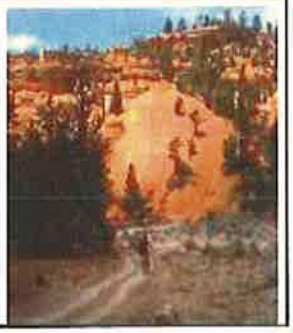
Class I Objectives

- Preserve the existing character of the landscape.
- Level of change to the landscape should be very low, and must not attract attention.
- Natural ecological change (Wilderness Study Areas-WSA or Ourstanding Natural Areas-ONA)
- Limited management activity.



Class II Objectives

- To retain the existing character of the landscape.
- Level of change to the landscape should be low.
- Changes should repeat the basic elements found in the natural features of the landscape.
- Management activities may be seen but should not attract attention of the observer.



Class III Objectives

- To partially retain the existing character of the landscape.
- Level of change to the landscape can be moderate.
- Management activities may attract attention, but should not dominate the view of the casual observer. Change should repeat the basic elements found in the natural landscape.

Class IV Objectives

- To provide for activities that require major modification of the landscape.
- Level of change to the landscape can be high.
- Management activities may dominate the view and be the major focus of attention.
- Still minimize impacts through location and design.

Special Management Areas

Sometimes areas are managed for special reasons. Scarcity or cultural events may be a factor.

Visual Contrast Rating System

- A systematic process to **analyze** potential visual impacts of proposed projects and activities.
- The degree to which a development adversely affects the visual quality of a landscape is directly related to the amount of visual contrast between it and the existing landscape character.

Visual Contrast Rating Method

The amount of contrast is measured by separating the landscape into major features

(land/water, vegetation, structures)

then predicting the magnitude of contrast in each of the landscape character elements

FORM – LINE – COLOR - TEXTURE

Analyze the contrast

Landscape Character Elements	Major Features: Land/Water	Vegetation	Structures
Form			
Line			
Color			
Texture			

Example of Contrast Rating

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION			
	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently rolling terrain, low hills	Low, continuous sagebrush cover, smooth, regular pattern	None need in view toward the project from the KOP
LINE	Mostly horizontal undulating lines & horizontal landscape	Weak horizontal lines created by changes in vegetative patterns	None need in view toward the project from the KOP
COLOR	Light brown to buff where visible	Gray green of sagebrush is dominant, mostly continuous	None need in view toward the project from the KOP
TEXTURE	Smooth, continuous	Medium to slightly coarse in immediate foreground to smooth/fine in midground	None need in view toward the project from the KOP

Break

Methods and Tools for Improvements

- Color selection
- Texture
- Proper Siting
- Reduce construction impacts

Color- rock staining

Color

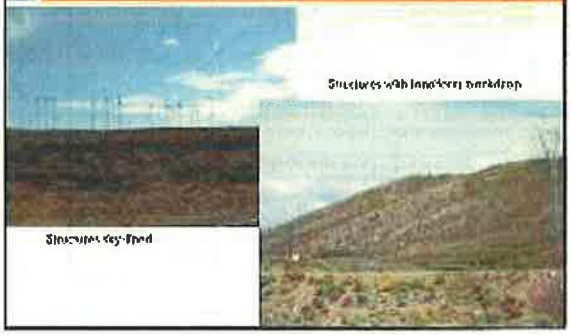
- Natural color of the landscape should be replicated.

Texture

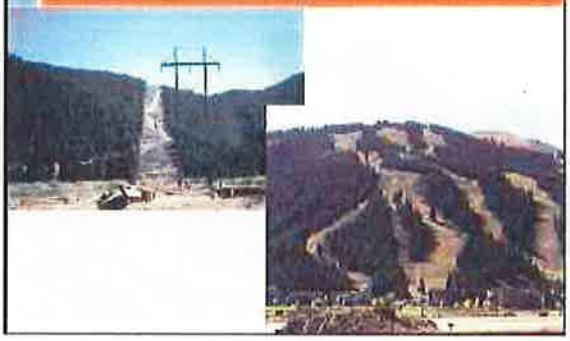
- Natural texture of the landscape should be replicated.

Texture- slope rounding

Proper Siting



Proper Siting of linear elements



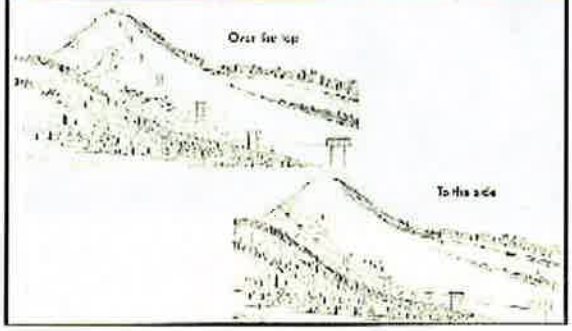
Reduce construction impacts

- Reduce access road footprint

Reduce construction impacts

- Don't clear entire right of way
- Fit access roads to the natural contours

Siting of Linear Elements



Visual Analysis of Sensitive Historic Properties

Case Studies

- Questar Soldier Creek
- Questar Green River Crossing


10/02/2007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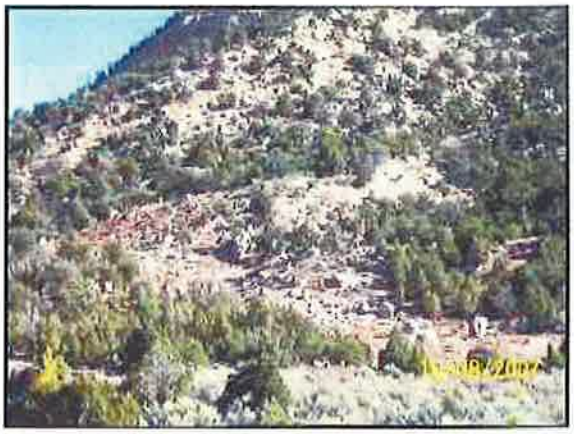


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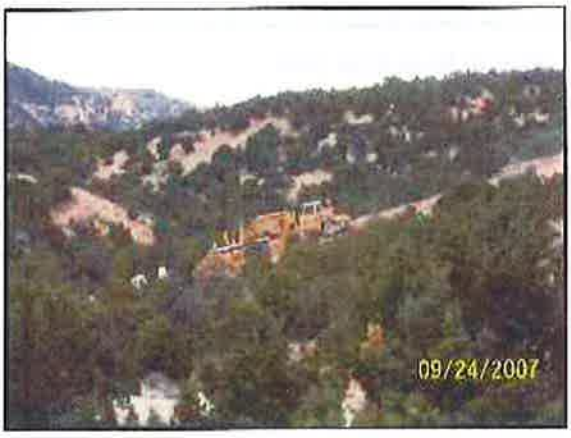
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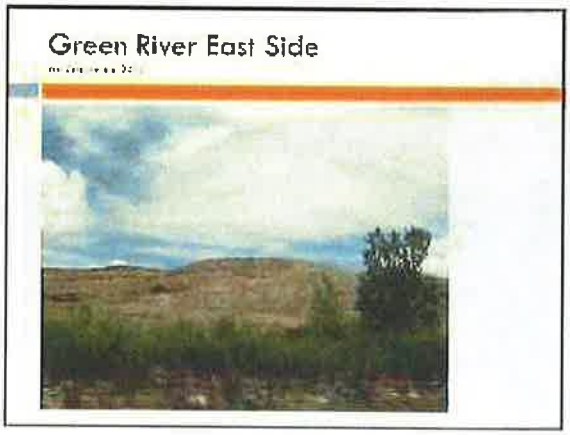
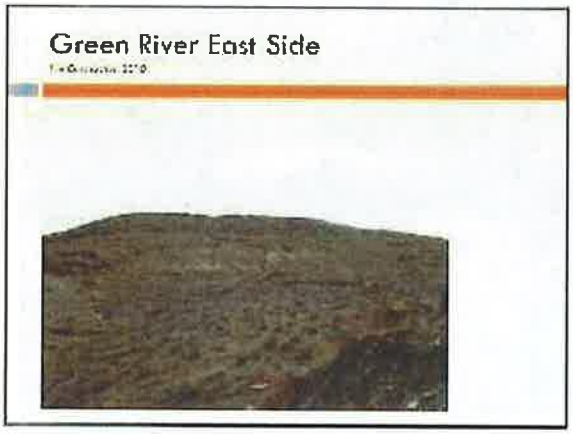
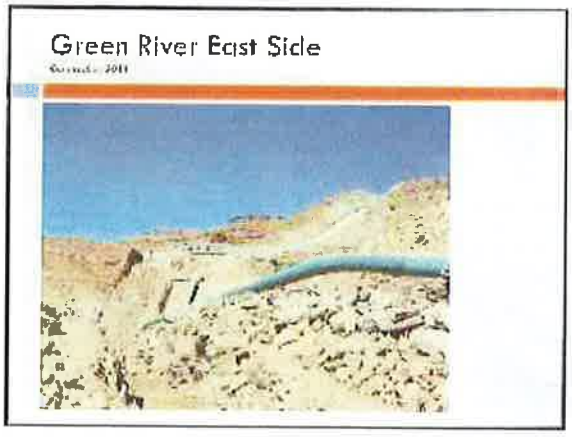
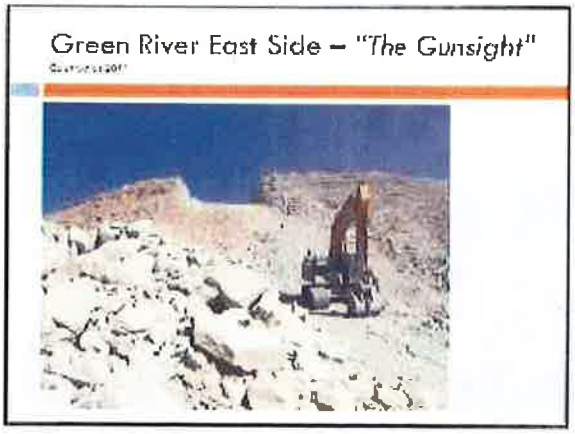
ML104 EXTENSION TO FIDLAR
Questar Pipeline Company


Project Overview Map

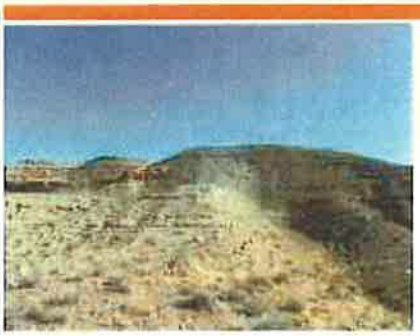

Green River East Side


Green River East Side


Green River East Side


Green River East Side – "The Gunsight"

Green River East Side



Green River East Side

Green River East Side

Green River West Side

Green River West Side

Green River West Side